Digitized by the Internet Archive
in 2018 with funding from
University of Toronto

https://archive.org/details/medjournalJan1927uoft

The University of Toronto Medical Journal

VOL. IV JANUARY, 1927 NO. 3

EDITORIAL.

Graduation and Then?

MANY of us when we graduate some time in the future intend to go out into active practice, in distinction to those who will take laboratory appointments. When we go into practice we wish to serve the public and serve ourselves. Which of these objects comes into the mind depends on the individual. That our service to the public is a very definite thing, and that some forget about it, is amply demonstrated by the provision that the law makes for the public regarding this. Can we best serve the public by going out into our own practice directly upon graduation? The public is concerned with the doctor's manner and also with the result of his treatments. If they do not like the doctor, then he may not even get the chance to treat. What manner do we need to develop and how is it best developed? What it is, is not easily defined, but we can learn to meet people only by the actual doing of it. In my opinion this would be acquired faster and better in general practice than in hospital. In the hospital too many of the one class of patient are met; we have not the sense of personal responsibility for the case when there are others to back us up in everything that is done; each person likely does not receive the respect that he or she would if our daily bread depended on the respect shown, as it does in practice. Thus in this one respect we would probably improve more rapidly by practising outside.

Concerning our service to the public with regard to treatment, diagnosis is the first thing in this and, as a rule depends on the deductions made from a careful history and physical examination. In our course in medicine there is not enough of the actual contact with the patient to make us expert at this. If we go directly into practice we are liable to make many mistakes which may prove costly to the public and indirectly to ourselves. If internship work is taken in a hospital a great part of the work is the taking of histories and the making of examinations so that with accuracy as the criterion, speed in this branch of the work is also acquired. Thus in this respect an internship is highly desirable.

The actual treating of the patient comes next. There is practically no treating done by the student except a little in the outpatient departments. Most of therapeutics for the student is book-work, and the watching of others. For a student to go straight into practice and to handle drugs of which he has probably only read the action, or to perform even minor operations does not seem right. A reasonable term of internship for this would seem desirable.

Having discussed the public's side of the question, which cannot be separated entirely from our own, we will discuss the actual value of an internship to ourselves. If we go into a hospital we meet as a rule a type of case which is more severe than that met in our office or home practice. Thus there is a disproportion in the types of cases we will meet. This may be used as an argument against the hospital internship, but is a very minor one and is offset greatly by the fact that outpatient hospital services give more of the average type of case met with outside.

There is also the question of finance to be considered, which influences much the length of internship and the type of hospital one enters. The better internship (those in the large teaching hospitals) do not as a rule carry any stipend with them, or very little. The circumstances of the individual thus play a factor in internship.

The demerits and merits of entering a

hospital for internship have been discussed and the advantages are decidedly in favour of it. The next question is how long should one spend in a hospital. For general practice, one year at least, and two years or more if circumstances permit would be better. For any special branch of work a general rotation service for one year and then the special work is advisable. Some may argue against any general work at all. Most hospitals demand this before the other is started upon. If one is able to start the speciality immediately then the rotation service should at least be considered first. It is not likely if it is not taken before the special work, that it ever will be taken and there is no one branch of medicine which is absolutely separated from another. A general knowledge is of the utmost importance.

With regard to special branches of work which a certain percentage of students enter, they are very numerous. As the scope of medical study increases it becomes more necessary that there be specialists along certain lines. For example, it was not many years ago that a radiologist was unknown. Now we depend upon him perhaps too much. The following is a small list of special studies :general medicine, neurology, dermatology, pediatrics, obstetrics, and gynecology, radiology, general surgery, orthopedic surgery, urology, otolaryngology and rhinology, opthalmology, psychiatry, and public health service. The choice of a special line of work depends entirely on the man himself and his liking for the work, and the opportunities which are presented for his entering the study.

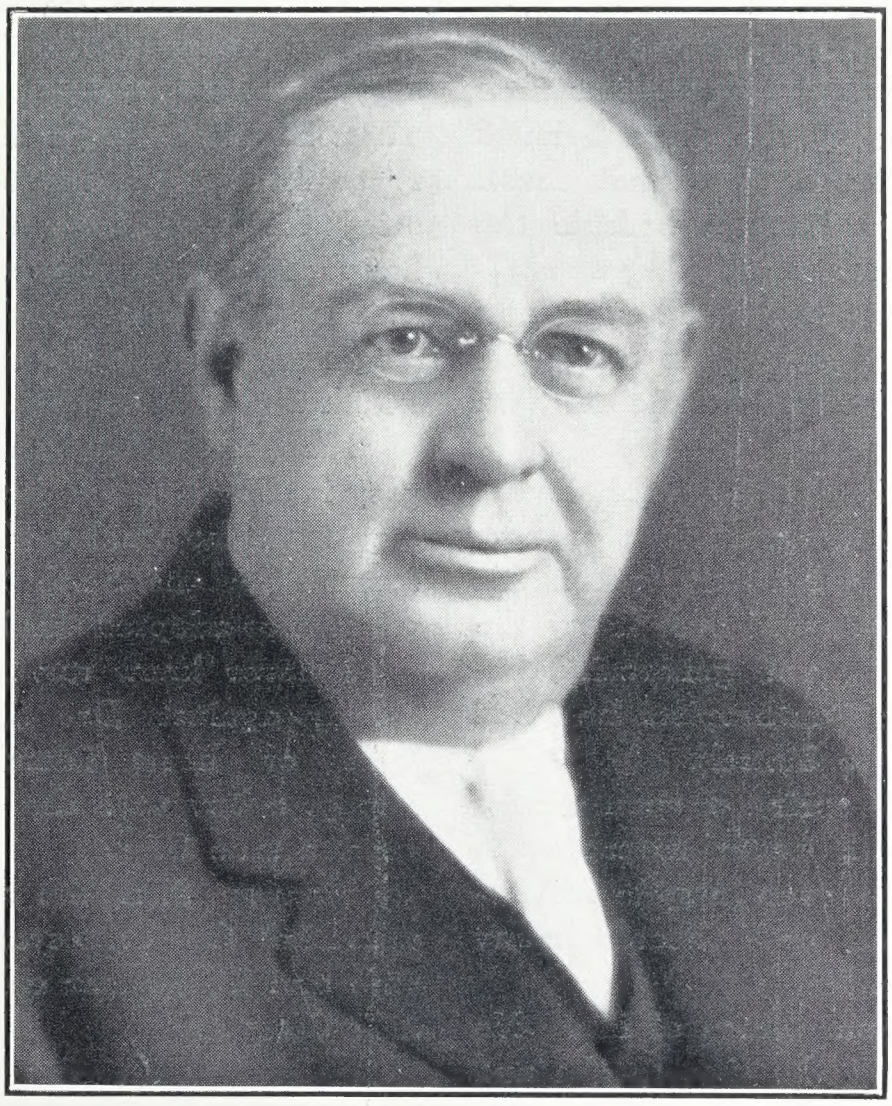
To what hospital should one go? This is chiefly a matter of opportunity, but hospitals may be divided roughly into the large teaching hospitals, the large non-teaching hospitals, the small non-teaching hospitals. The advantages of going into a small hospital or clinic where one would still get direction and advice, but where perhaps a little more practical work would be obtained, are to be considered. For some men it is the careful study of a few cases rather than the quick survey of many cases which does the most good, so that the size of the hospital is not so much of importance as the quality of the staff, and the opportunity to work. Other men get more good out of having a greater number of patients pass through their hands. For the average man whether he is taking one year or more, the large teaching hospitals are the best.

The teaching hospitals are those connected with medical schools and are so numerous that it would be impossible to note them here. For students who wish to get immediate information on hospitals the best way is by medical directories. Those for Canada, United States and Great Britain can be seen at the university, medical and academy libraries. That for Canada names all the hospitals in the different provinces, their capacity and very little other information. That for United States is much more complete and is a list of approved hospitals with their location; number of beds (surgical, medical, other); interns—number and whether chosen by examination or by application, and the date of the examination, or time for application; the length of service; the presence of an out-patient service, accident cases, necropsies, or a medical library; the salary per month which goes with the service; and the presence or absence of a training school for nurses.

The method by which men are chosen for the internships in various hospitals is by examination or application. In the case of the latter the recommendations which are obtained would count for much. In some cases also the hospital writes to the medical school from which one has graduated and gets the student's record. In applying to a number of hospitals and receiving an appointment in one, all other applications should be cancelled. Sometimes this is neglected and the result is that in the following years students from the same school have difficulty in obtaining appointments at these hospitals. If an accepted appointment has to be given up at any time, then the hospital should be notified immediately that the position may be filled.

The whole object of this article is to help the student in the decision which must be made on graduating as to whether to serve internship, and for how long, and where. No list of hospitals could be taken and their services described because in the case of most of the large teaching hospitals pages would be needed to describe the special characteristics of each.

An Appreciation.



THE LATE DR. GIDEON SILVERTHORN

IN the untimely death of the late Dr. Gideon Silverthorn on December 4th, the University of Toronto lost a great teacher and the students of Medicine a true and valuable friend.

As Professor of Medical Jurisprudence, he went out of his way to make his lectures the most entertaining and at the same time among the most instructive to which we were privileged to listen. No one, not even "the occasional," ever dreamed of missing one of those lectures. He loved to illustrate with stories embellished with his own exquisite humour and to join heartily with his listeners in the laughter which followed. I have seen the habitual note-taker sit back, fold his arms and prepare to enjoy this hour of pleasure and incidentally to have stencilled on his mind the fundamental facts of the subject. Long after the others' notes have perished those who listened will remember the legal requirements for the validity of dying statements, as illustrated by "I know I die; Tony shoot." Nor shall we ever forget the last lecture in January, 1926, when, with all the pomp and ceremony of an oriental magician, he hypnotized the long-suffering guinea-hen.

He loved to teach and laugh. We loved to listen, laugh and learn. Can the art of teaching be improved upon?

It is a tradition that no one ever failed in Medical Jurisprudence. There is a story told wherever Meds. gather, that one time Dr. Silverthorn was marking the papers and coming on one impossible and wonderful epistle, he characteristically put the blame on himself when he exclaimed: "Oh! those poor boys, those poor boys, what have I been telling them? I'll have to give this fellow fifty anyway."

It was a great privilege to be in Dr. Silverthorn's clinic. He took a deep personal interest in each student, and many a Med.

has been very surprised and pleased when he has been addressed in the name of his home town or of his father's business. He took great pains to show unusual cases or cases which illustrated any desired subject. He was always kind and his good-natured impatience made him all the more beloved by patients and students. I cannot recall ever having seen him leave a bedside the occupant of which was not laughing or smiling. He was very observant at all times and consequently depended very little on examinations and indeed had very little faith in them.

No one will ever know how whole-heartedly he helped the undergraduates; or how he fought our battles both as individuals and as a body. No one will ever know the extent of his sympathy and generosity, because like all true philanthropists he liked to keep these things to himself.

He was a veritable spring of spontaneous humour, never forced, never sarcastic; it came forth, I feel sure, even in spite of himself, on all occasions, and cheered many sad hearts and sore bodies.

He loved the simple things of life. He liked to get away from the city, to fish and hunt. What an ideal companion for a canoe trip!

I like to think of him best as a story-teller. He was a master of the art. With that perennial twinkle in his eye, he would say, "Did I ever tell you about the time. . . ?" Then he would begin slowly and deliberately to choose his words and to cast a real story from whatever the original incident happened to be. You could see him adding touches here and there while the increasing frequency of chuckles indicated the progress which he was making.

His keen interest in the teaching of surgery is shown by the fact that it was he who suggested the weekly Friday afternoon conference for the Sixth Year surgical group, which was adopted this last Fall.

I never knew anyone who had a word to say against Dr. Silverthorn. He was light of heart, friendly, cheerful, always happy, a boy with the boys, a lovable comrade, a true friend.

How we miss him and shall continue to miss him! Our deep sympathy goes out to his wife and his former colleagues at St. Michael's Hospital.

W. S. KEITH.

Jean Paul Marat, Physician and Revolutionist.*

E. P. SCARLETT, M.B.

"Across these scenes I could follow Marat that was never himself, and that carried a mad torch without sequel, but just avoiding catastrophe."—Belloc—"Robespierre: A Study."

"Behaviour is the garment of the mind."'—Bacon.

MUCH biography unless it be spiced with small talk and garnished with scandal, is apt to be tedious. The Don Juans are the interesting people of history. Because medical history I suppose contains so few Don Juans, much of it, to quote the words of an old writer, "Dulleth the wits, rankleth flesh, and palleth ofte fresh bloods." Instead of a Don Juan we have a villain of another sort to consider.

In this most satisfying of all epics of India, "'Kim," Kipling says: "India is full of holy men stammering gospels in strange tongues, shaken and consumed in the fires of their own zeal; dreamers, babblers and visionaries; as it has been from the beginning so it will continue to the end." With the substitution for India of the phrase, "France in 1789," the sentence well expresses the rapidly moving scenes, the personalities and the sinister forces of the French Revolution, and the many episodes in that drama—the sacking of the Bastille, the sittings of the Revolutionary Tribunal and the Terror. One of the strangest figures in those years, and in some respects one of the strangest figures in world history is the physician, Jean Paul Marat. Marat was one of the Trio—Robespierre, Danton and Marat,—who were the dictators during the most stormy years of the Revolution. Lacking the intellectuality of either Robespierre or Danton, he is a far more sinister figure. "Political biography does not record a more vehement apostle of the doctrines of government by murder." History has set him down as a bloody monster, which estimate we shall consider, and which I fancy we must modify.

Marat is not only a challenging example of the medical "Rogues' 'Gallery," but interesting in illustrating the way in which doctors have achieved fame or notoriety in other fields than medicine. A fascinating series of sketches of such men could be presented. In the literary world alone there occur such names as Rabelais, Smollett, Akenside, Arbuthnot, John Brown, John Keats, Oliver Goldsmith, Francis Thompson; Robert Bridges, the present poet laeureate of England; Dr. Georges Clemenceau, "The Old Tiger"—and so on.

Marat is interesting, too, from another point of view. An insane man, a true paranoiac, he still was one of the dominant figures of a great social upheaval. To those of you who are concerned with the Bolshevist figures in the Russian Revolution, the character of Marat offers a fascinating parallel to those figures who moved about the murdered czar. Recently, too, Shaw's study of Joan of Arc has raised the question as to how far historical events have been influenced by persons demonstrably insane. Marat is a study in connection with this problem.

Marat's life was played out against a complex background. Unlike most lives, it is too dramatic to be dull. Until recently, accepted accounts of his life have begun practically with the opening years of the Revolution and have passed over the early years of his life in a few sentences. Further, old accounts were either frankly eulogistic, or, in the case of historians of the Revolution, unfriendly. What was known of his early life was largely drawn from Marat's own account, and we shall learn presently to discount such a source. During the past two or three years several writers have busied themselves with exploring what was formerly a sealed page; others notably psychiatrists, have been analyzing the mental procession of the man. The exploring of such sources has been most interesting. The resulting account is therefore at variance with such notices as that of the Encyclope-

*This sketch is not an exhaustive historical study, but professes to be little more than an impression of a figure that must always interest the student of medical history. The author is aware that the conception of Marat herein set down is in conflict with that of many authorities, notably M. Briand, whose essay on this character has recently appeared. After all, such a study as this must always be, in Sir Clifford Allbutt's happy phrase, an excursion "in the byways of the fallible."

dia Brittanica. At the outbreak of the Revolution Marat was forty-five; what transpired before then we may term Marat as physician. Had it not been for the Revolution Marat would never have been heard of. The Revolution achieved for him, a sinister obscure quack doctor with a stunted body and a diseased mind, a lasting place in history. The steady, conscientious physicians of his day, who would not admit him into their societies, have disappeared. You remember the sentence of Osler's master, Sir Thomas Browne—"But the iniquity of oblivion blindly scattereth her poppy."

Marat As Physician.

It has already been noted that the accounts of Marat's early life are drawn mainly from Marat's own statements. According to most biographers his career was a brilliant one—studying medicine in Borbeaux, Paris and London; practising in London, where his fame obtained him an honorary degree; writing books, scientific and political, which made him honored for his scientifific attainments and spied upon and feared for his political views; later moving to Paris, where his medical ability caused him to be called "the physician of the incurable"'; finally throwing over all to become "the friend of the people" and assist in the Revolution. Historical research has revealed a career in such striking contrast to this that one can easily imagine the egocentric nature of the man who created such a fanciful account of his own early life.

Marat was born in 1743 in the Swiss Canton of Neuchatel. He was educated in the main by his father, who was a printer and a designer. About his seventeenth year he left home, studied in Toulouse, Bordeaux, Paris and London. About 1765 at the age of twenty-two, he probably started to practise medicine of a sort in Church St., Soho, London. The first specific record which we have of him is two years later. Old Slaughter's Coffee House stood at the upper end of St. Martin's Lane, a street tenanted by English and foreign artists for whom "Slaughter's"' was a social centre. Two artists speak of Doctor Marat, who lived nearby. He apparently treated one for gonorrhoea. They note that he was interested in politics, a follower of John Wilkes and sympathetic with all opposition to government. In 1770-1772 he practised human and veterinary medicine in Newcastle-on-Tyne. An observer in Newcastle writes "It was difficult for one to conceive the sallow man with pock-pitted countenance, black, flat hair, blood-shot eyes and spasmodically twitching mouth—the incarnation of the repulsive—so highly regarded." Apparently Marat was well thought of in those days. About this time he published his first work. "An Essay on the Human Soul," in which he declared that physiology alone could solve the problems of the connection between soul and body and proposed the existence of a nervous fluid as the true solution. Two years later he published anonymously and in English his first political book, "Chains of Slavery." The book is the characteristic production of the paranoiac. It consisted of sixty-five chapters in which "the dark objects, crafty proceedings, secret plots, fatal policy and deceitful arts" of "royal despots and tyrant princes" are set forth. Its purpose was "to secure the triumph of liberty in England." He says that in writing this book he devoured thirty volumes, worked twenty-one hours a day for three months, kept going by drinking excessive quantities of coffee, that immediately on completion of the book he fell ill, became stuporous, lost all power of memory, and recovered in thirteen days "by the aid of music and repose."

On the thirtieth of June, 1775 (Marat was now thirty-five) he was granted an honorary degree of M.D. by St. Andrew's University. The fact is that St. Andrew's at this time was desperately short of funds and an honorary degree was to be obtained by the payment of ten guineas without examination on the recommendation of two physicians. He returned to practise in Soho, London. In reality he was really an unlicensed practitioner, his name not appearing in any medical or social directory of the time. No one could practise in London or several miles around it without the license of the Bishop of London or the Dean of St. Paul's, made on the recommendation of four "doctors in physic" or other "experts in surgery." Marat never obtained such a license. He published about this

time pamphlets on "Singular Disease of the Eyes" and "An Essay on Gleets." In short, he divided his time between abstract science, anonymous political propaganda, and unlicensed traffic in human and veterinary medicine.

One sample of his style must suffice. This is from an article written later in Revolutionary days.

"All that a man of sense and a man of heart could do to save his country, I have done to defend mine. Alone and without support I have fought for two whole years against the commissioners of sections, the municipal administrators, the chiefs of state, the government, the prince, the National Assembly itself, and often with success. . . I have unmasked the Parisian general, raised the army and the fleet against their despotic chiefs; more than once I have compelled committees to resign, to suspend or to revise their projected decrees; I have struggled against oppressors of every kind; I have rescued a hundred thousand victims from judicial tyranny. More than once I have made the tyrant on his throne turn pale, and dismiss his frightful agents. . . Exposed to their wrath, I have been pursued again and again by the ministers and the municipal administrators. Twenty military expeditions directed against me, and a whole army mobilized to tear me away from the people have only increased my audacity. A price has been put on my head; five cruel spies put on my tracks, and two thousand assassins paid to slay me, have not for an instant succeeded in making me betray my duty. . . .This kind of life, the mere recital of which freezes the most callous heart, I have led for eighteen long months without one moment complaining, without once asking for rest or recreation, without heeding the loss of my health, of my estate, and without blanching at the sight of the sword always pointed at my heart."

A self-effacing patriot indeed! Marat was hard put to it to make a living. Probably for this reason we next find him in Warrington Academy—a school in the Midlands—acting as instructor in French under the assumed name of M. Le Maitre. Later he went to Oxford as instructor in drawing and a form of embroidery. He formed a friendship with an official of the Ashmolean Museum, then later broke into the museum and stole medals and chains to the value of 100 pounds. He escaped to London, where he sold some of the medals, fled to Dublin, was arrested there and returned to Oxford. He was tried and sentenced to five years hard labor on the docks at Woolwich. He served about six months of this time, and escaped to France in 1777.

In Paris he carried on for a few months in practice, but very shortly after entered the household of the Comte d'Artois as physician. He was one of a staff of twelve and apparently did veterinary work in addition. He obtained the position, it is believed, through the Marquise de L'Aubespierre, a neurotic patient whom he had helped medically, and afterwards seduced. A contemporary writes:

"On the 24th of June, 1777, the gatekeeper of the Comte's magnificent mansion witnessed the arrival of a curious personage. Although only five feet tall, he carried his head proudly. It was broad and bony, thin lipped, brown skinned. His brilliant eyes, full of fire, were not on the same horizontal line because one of his cheekbones was higher than the other. To sum up, a pitiful individual whose aspect inspired simultaneously a sort of repugnance, disgust and contempt."

The gatekeeper laughed.

"And what name shall I have the honour of sending to Monseigneur?"

The little man rose on tiptoe, drew up his slender figure, and said with his hand on his sword-hilt:

" 'Announce the Chevalier de Marat. I am the new Doctor of Monseigneur's bodyguard.' "

In addition to this appointment he carried on practice in the city. He probably had a fair success at first. He wrote scientific papers on light, electricity and fire which contained nothing original. Gradually, however, he became involved in several unsavory affairs, his practice slumped, he was branded as a charlatan by scientific and medical men of Paris. In 1784, seven years after joining Comte D'Artois, he disappeared again. Until recently the period from this time until the Revolution has been a blank. Phipson, an English writer, recently has

shown that Marat again went to England. Under the name of John White he started as a teacher of embroidery in Edinburgh. He contracted debts, fled to Newcastle, was arrested, brought back to Edinburgh, found to be the same person as the Oxford "Le Maitre," and after his release left Scotland early in 1787. Later under the name of "Marat Amiatt," he practised medicine in several English towns. He started business in Bristol as a bookseller, was imprisoned for debt, released by a benevolent society and afterwards recognized by one of its members in Paris as the fiery Marat of the Revolution.

But in France events were moving rapidly up to the Revolution. Rousseau had been its first voice. The material misery caused by the wars of the great Louis and the contrast which had existed between orders in the social life for generations were stirring the nation. The misery of the common people was profound. There is LaBruyere's picture of "certain wild animals, male and female, scattered over the fields, black, livid, all burnt by the sun, bound to the earth that they dig and work with unconquerable pertinacity; they have a sort of articulate voice, and when they rise on their feet, they show a human face and, in fact, are men." The gaunt spectacle which we call the Revolution was gradually coming "into pale outline." In this year, 1788, the Notables had met and had advised the King and his ministers that the States General which had not been convened for one hundred and fifty years, should meet. The assembly of this body was decided upon, the election causing a flood of pamphlets, one of the most prominent being Marat's. In May, 1789, the States General convened, and in procession marched to Notre Dame Cathedral for divine worship —the King, the clergy, the nobles, and the six hundred representatives. Standing on tiptoe watching that procession is our physician. Carlyle tells the story thus

"Surely also in some place not of honour, stands or sprawls up querulous, that he too, though short, may see—one squalidest, bleared mortal, redolent of soot and horn drugs: Jean Paul Marat of Neuchatel. O Marat, Renovator of Human Science, Lecturer on Optics, O thou remarkablest Horse leech, once in D'Artois' Stables—as thy bleared soul looks forth through thy bleared, dull acrid, woe-stricken face, what seest it in all this?"

Marat saw the coming Revolution and from now on his story becomes that of the Revolution. Marat, the physician, is dead.

Marat the Revolutionist.

At the outbreak of the Revolution Marat was forty-five; his career to date had been little more than that of an unbalanced criminal; he was loathsome in appearance, violent in manner, reduced in circumstances. The forces gradually gaining momemtum through the nation fired the political ideas which he had always cherished. "Rousseauism filtered through his paranoiac brain became translated into action," and speedily he became the firebrand of the Paris mob and one of the directory geniuses of the Revolution. He had founded a paper in 1789—L'Ami du Peuple—and used it to attack everyone in power. In these days and in the stormier ones which followed, he stood alone, attached to no party. Suspicion was present in his mind to a pathological degree. He suspected whoever was in power. If a person suspected another he had only to denounce him to Marat, and the denounced was never let alone until proven innocent or guilty. Probably the most sober judgment which may be passed upon him is that more than any other he had within him the seed of violence which later was to become the Terror.

He first came into prominence at the sacking of the Bastile. Carlyle describes the circumstances thus

"One poor troop of Hussars has crept, reconnoitering, cautiously along the Quais, as far as the Pont Neuf. 'We are come to join you,' said the captain, for the crowd seemed shoreless. A large-headed, dwarfish individual, of smoke-bleared aspect, shambles forward, opening his blue lips, for there is sense in him, and croaks: 'Alight then, and give up your arms.' The Hussar captain is too happy to be escorted to the Barriers, and dismissed on parole. Who the squat individual was? Men answer: It is M. Marat, author of the excellent paper, 'Avis au Peuple.' Great, truly O thou remarkable Dogleech, is this, thy day of emergence and new birth."

He continued to preach revolution, theft

and general murder. He took a large part in arranging the mob which escorted the king from Versailles to Paris. He was constantly being denounced and imprisoned and was forced to fly to London for a time because of his attack on Lafayette. Returning to Paris, he lived like a hunted dog in the cellars and sewers, attended only by a strange woman, Simonne Evrard, who remained faithful to him. Again Carlyle: "Poor is this man, squalid and dwells in garrets; a man unlovely to the sense outward and inward, a man forbid;—and is becoming fanatical possessed with fixed idea. Did Nature, O poor Marat, as in cruel sport, knead thee out of her leavings, and miscellaneous waste clay; and fling thee forth, a distraction, into this distracted Eighteenth Century? Work is appointed thee there which thou shalt do. The Three Hundred have summoned and again will summon Marat; but always he croaks forth answer sufficient; always he will defy them or elude them; and suffer no gag."

He was finally elected to the Assembly in 1782. In this body he was unpopular; no one would sit beside him. And yet he forced a hearing for himself. Day in and day out he harangued the newly-elected representatives of the people and croaked, "Nous sommes trahis." He insisted that two things were needed to cleanse France—the death of the king and the guillotining of two hundred and seventy thousand aristocrats. Madame de Pompadour had gayly exclaimed sometime before, "Apres nous le deluge!" Verily, the deluge was about to descend! Carlyle comments again:

"Two hundred and seventy thousand aristocrat heads—that is the precisest calculation though one would not stand on a few hundreds; yet we never rise as high as the round three hundred thousand. . . . A Cassandra—Marat cannot do it, with his single shrunk arm; but with a few determined men it were possible. . . There is no jesting in those rheumy eyes; in that soot-bleared figure, most earnest of created things; neither indeed is there madness of the strait waistcoat sort!"

War with Austria was begun in April, 1792, which Marat opposed as serving the purposes of the Royalists and withdrawing the leaders of the people from Paris to the battle-front. In December the king was brought to trial, on the 20th of January, 1793, sentence of death was passed upon him and on the following day he was beheaded. Revolts burst out all over France. Christianity was deposed; Marie Antionette, the widowed queen, was guillotined; a reign of lawlessness and blood succeeded. The months of the Terror began.. Marat was now supreme. He had been engaged in a bitter struggle with the Girondists, the Conservative or Moderate party. At first the tide had gone against him; the Girondists ordered his trial before the Revolutionary Tribunal. Carlyle again:

"Thereupon there comes, visibly stepping up, visibly standing aloft on the Tribune ready to speak — the Bodily Spectrum of People's Friend Marat. Shriek, ye Seven Hundred and Forty-nine; it is verily Marat, he and not another. . . 'It appears,' says Marat to the shrieking assembly, 'that a great many persons here are enemies of mine.' 'All, all,' shriek hundreds of voices: enough to drown the People's Friend. But Marat will not drown; he speaks and croaks explanation; croaks with such reasonableness, air of sincerity that repentant pity smothers anger, and the shrieks subside, or even become applause. . . Then the shrieks rise anew, and the Decree of Accusation is on the point of passing; till the dingy People's Friend bobs aloft once more; croaks once more persuasive stillness, and the Decree of Accusation sinks. Whereupon he draws forth a pistol; and setting it to his head, the seat of such thought and prophecy says, 'If they had passed their Accusation Decree, he, the People's Friend, would have blown his brains out.' A People's Friend has that faculty in him—'No power on earth can prevent me from seeing into traitors and unmasking them—by my superior originality of mind.' An honorable member like this Friend of the People few terrestrial Parliaments have had."

He was finally sent before the Revolutionary Tribunal, acquitted and returned to the Convention with the people of Paris at his back. We read:

"But on Wednesday afternoon, 24th of April, year 1793, what tumult as of fierce jubilee is this? It is Marat returning from

the Revolutionary Tribunal. . . And so the eye of history beholds patriotism which had gloomed unutterable things all week, break into loud jubilee, embrace its Marat, lift him into a chair of triumph, bear him shoulder high through the streets. Shoulder high is the injured People's Friend, crowned with an oak garland amid the wavy sea of red night-caps, jackets, grenadier bonnets and female modcaps; far sounding like a sea. The injured People's Friend has here reached his culminating point; he, too, strikes the stars with his sublime head."

The Convention was purged of Girondists, and Marat with Robespierre and Danton ruled supreme.

He was the first of the Triumvirate to fall. Charlotte Corday, a young woman of twenty-four, living in Caen and in sympathy with the Girondists, conceived it her duty to kill Marat. With a note of introduction to him and a slight stock of luggage, she left Caen on Tuesday, the ninth of July. Arriving in Paris, she purchased a large sheath-knife in the Palais Royal. That same morning she addressed the following letter to Marat by post:

"Citizen:

"I have just arrived from Caen. Your love for the country makes me think that you will be interested to know the unhappy events in that part of the Republic. I will call upon you about one o'clock. Be so good as to receive me and grant me a moment's interview. I will show you how to render France a great service.

"Charlotte Corday."

As Esquiros says, "A perfidious intention like a knife-blade was hidden under the last sentence."

Receiving no reply, Mademoiselle Corday took a hackney coach to the Rue des Cordeliers No. 44 (now Rue de l'Ecole de Medecine)—the residence of Citizen Marat. She was denied admission; the citizen was ill. She returned again at seven in the evening and insisted on admission. Marat, overhearing her plea that she bore important news from Caen, cried out from within, "Admit her." Marat was in his bath. For years he had been a sufferer from what modern observers believe to be dermatitis herpetiformis. The agony of the pruritus was intense and for years he had no relief save when in his tub. He stayed in it for hours, worked in it and was killed in it.

Marat asked Charlotte her business. She gave him the names of several Deputies at Caen whom she said were traitors. "Their heads shall fall within a fortnight," he croaked in reply. As he took up his tablet to write, Charlotte stabbed him, making a wound, as the autopsy record shows—"between the first and second rib, traversing the upper part of the right lung as well as the aorta and going into the left clavicle." He died instantly. It was the evening of the 13th of July, 1793—just four years after the eve of Bastille day when Marat first became a notable among Patriot men.

The death caused a great commotion. Charlotte Corday was summarily tried and guillotined. Robespierre's sole comment on the event was, "I am myself marked out for daggers." The mob made a god of Marat; the whole Convention attended his funeral. His bust was placed in the Convention Hall. The noted artist of the day, David, painted a portrait of "Marat Assassinated," and a worship was rendered to the "Friend of the People." His ashes were transferred to the Pantheon with pomp on September 21st, 1794, but cast out again by a decree in the following year.

So died Marat. He must be considered among the insane. He presents the cardinal symptoms of paranoia—intense egoism, delusions of persecutions, unlimited verbosity and an angry grandiose manner. His whole moral code was perverted. But as we noted at the outset we must modify that judgment which would have him a bloody monster. He was undoubtedly insane, and the furnace through which he passed played upon the worst in his infirmity. Admittedly he was not one of the great souls of a period which remade the world. But in his fantastic mind, side by side with the madness was a relief—strained and warped as it was—in great truths which somehow led him on to his destiny. No physician with a stranger or more dramatic history ever lived.

EDITOR'S NOTE—It has been a pleasure to read and publish this excellent historical sketch from the pen of one who was a founder and one of the first Editors of this Journal.

Exophthalmic Goitre: Medical Aspects.*

W. MAGNER, M.D., D.P.H.

EXOPHTHALMIC goitre is an interesting disease of obscure etiology and doubtful nature. Most of its symptoms are those of sympathetic stimulation and many of them occur transiently in healthy individuals as a result of violent exercise or of strong emotions, such as fear or anger. Subjects of the disease show an increased nitrogenous metabolism and, commonly, a diminished carbohydrate tolerance. Structural changes are present in the thyroid gland and, usually, in the lymphatic system, in the thymus and in the heart. It is generally believed that the disease is a manifestation of hyperthyroidism, this belief being based upon the microscopical changes in the thyroid gland and upon the result of thyroidectomy which usually leads to a more or less complete, though perhaps temporary disappearance of symptoms. Plummer thinks that not only is there an excessive production of normal thyroxin, such as occurs with hyperfunctioning adenomas of the thyroid, but also an outpouring of abnormal, incompletely iodised, thyroxin molecules. This conception led him to a therapeutic trial of iodine, with most happy results.

The recognition of exophthalmic goitre may be very easy or, in its early stages or less typical forms, it may be difficult. Many of its symptoms are present in other diseases and mistakes in diagnosis are frequent. Particularly in countries where simple goitre is endemic, confusion may arise between exophthalmic goitre on the one hand and, on the other, such conditions as neurasthenia, toxaemia from focal infections, neuro-circulatory asthenia, early pulmonary tuberculosis, diabetes or heart disease. Hamilton and Lahey find that about 30 per cent. of patients referred to their thyroid clinic fail to show any disorder attributable to the thyroid gland.

An individual suffering from exophthalmic goitre usually is under forty years of age. If the disease is well established he may give a history of prolonged ill-health with periods of exacerbation and remission of symptoms. He complains of nervousness and irritability, of fatigue and muscular weakness, of palpitation and breathlessness on exertion, of loss of weight in spite of the fact that his appetite is excellent. He may suffer from periodical attacks of diarrhoea, vomiting and gastric pain. He probably will have noticed an enlargement of his thyroid gland and a throbbing sensation in his neck. He, or his friends, may have noticed increased prominence of his eyes. When questioned, usually he will state that he has a constant feeling of warmth and that he sweats easily, so that warm weather or warm rooms render him uncomfortable. His appearance is suggestive. His eyes have an unwinking, staring expression, definite exophthalmos may be obvious. He is extremely restless or, in the absence of restlessness, his attitude suggests marked tension. Though in general cheerful and optimistic, he is liable to emotional outbursts during which, as Plummer says, he may be as difficult to manage as a drunken soldier. His skin is moist and flushed. His temperature may be elevated slightly. His heart action is persistently rapid, extrasystoles or auricular fibrillation may be present. His outstretched hand and arm show a fine tremor. His finger nails may show trophic changes. His pulse pressure is high. His superficial arteries pulsate visibly. His thyroid gland is enlarged and firm to the feel, a systolic thrill may be felt over it and, on auscultation, a prolonged systolic murmum may be heard over its superior poles. His urine may show the presence of sugar and, after injection of glucose, his blood may show hyperglycaemia and a sugar curve with a delayed return to the fasting level. Estimation of his basal metabolic rate yields an abnormally high figure.

In the severer forms of the disease the patient is liable to suddenly occurring crisis of "thyroid storms." These are characterised by high temperature, extreme rapidity

*Read before a combined meeting of the Section of Medicine and Surgery, Academy of Medicine, Toronto. December 14th, 1926.

of the pulse and respirations, vomiting and diarrhoea, intense physical restlessness, and delirium which may be followed by coma and death. The exciting cause of such a crisis may be an intercurrent infection or any severe physical or mental strain. It is most commonly encountered as a result of improperly timed surgical interference.

In the typical form which has been described, exophthalmic goitre can be recognized at a glance. Often, however, the picture is not so clear cut. Symptoms such as nervousness, fatigue, tachycardia, gastric disturbances and vasomotor disturbances are present in many disorders, and if the characteristic triad of a persistently rapid pulse, an enlarged hypervascular thyroid and bilateral exophthalmos is not well marked, the true diagnosis may not be suspected and the crucial test, an estimation of the basal metabolism may be omitted.

This procedure, estimation of the basal metabolic rate, is of the utmost value in doubtful cases. In the absence of fever a reading of 20 per cent. above normal is indicative of hyperthyroidism, this term being used to include exophthalmic goitre and toxic adenoma of the thyroid. The test, however, is not universally available, and it is to be remembered that unless it is carried out by a skilled operator employing the most accurate methods, the result may be misleading. Even under such circumstances it may be dangerous to base a diagnosis, in a doubtful case, upon the result of a single test. The state of anxiety and trepidation induced in a nervous patient may be responsible for a reading definitely above normal, and it may be necessary to repeat the test on several occasions, until the patient becomes familiar with the procedure and errors due to induced nervousness and restlessness can be eliminated.

The gradual development of bilateral exophthalmos is one of the most characteristic signs of exophthalmic goitre. This condition is due to contraction of the muellerian muscles under the influence of the over-active sympathetic nervous system. It often is absent during the early stages of the disease and sometimes throughout its course. It has been described as occurring in certain toxic states such as lead poisoning, and accompanies thrombosis of the cavernous sinuses. The peculiar unwinking stare described by Stellwag is due to widening of the palpebral fissure as the result of contraction of the levator palpebrae superioris. It is present, more or less well marked, in all cases of exophthalmic goitre, but may be found in normal individuals and is common in hysteria. Von Graefe's sign, a delay of the upper lid in following downward movements of the eyeball, and Moebius' sign, a failure in convergence of the eyes when looking at a near object, are present only in about 15 per cent. of cases and occasionally are to be found in healthy subjects.

Apart from exophthalmos, goitre and increased basal metabolism, which together are sufficient to establish a diagnosis of exophthalmic goitre, there are other signs almost equally characteristic and as constantly present. These are:

(1) The occurrence of loss of weight in spite of an increased food intake.
(2) The presence of a constant feeling of warmth associated with an increased tolerance of cold.
(3) Weakness of the quadriceps muscles out of proportion to the degree of general muscular weakness.
(4) The presence of a bruit over the superior thyroid arteries.

Wasting associated with an increased food intake is found only in diabetes and exophthalmic goitre and rarely will there be difficulty in differentiating these conditions. Occasionally, however, a patient with exophthalmic goitre shows glycosuria and, more commonly, a diminished carbohydrate tolerance which is not due to an inability to utilise glucose, as in diabetes, but to an abnormally rapid mobilisation of glycogen from the liver. In some cases, therefore, it may require careful study of blood sugar curves and of the response of the glycosuria to alterations in diet, in order to determine whether the case is one of exophthalmic goitre with glycosuria, diabetes, or a combination of the two diseases. It may happen that the question can only be answered by a determination of the respiratory quotient before and after a glucose meal; a sharp rise to a fairly high level will exclude diabetes.

A constant feeling of warmth persisting

over a long period independent of environment and not associated with fever indicates the onset of hyperthyroidism. It is due, of course, to the increased metabolic rate and, therefore, may not be well marked in the early stages of the disease.

Some observers attach much diagnostic significance to the development of weakness in the thigh muscles. This can be demonstrated by asking the patient to step onto a low stool or the step of an examining table. Frequently subjects who do not complain of general muscular weakness are unable to accomplish this movement without assistance.

In about 80 per cent. of cases of exophthalmic goitre auscultation over the thyroid gland will reveal a loud, prolonged bruit with its point of maximal intensity over its superior poles. This is a sign of the utmost diagnostic significance, although it may be present in the case of vascular colloid goitres. Murmurs originating in the carotid arteries may be present in normal individuals and are of no significance, they also may be heard at the superior poles of the thyroid, but are to be distinguished from the characteristic murmur arising in the superior thyroid arteries by their shortness and by the fact that they are best heard just above the clavicle.

Occasionally it will happen that notwithstanding a most careful examination of the patient and even in spite of a metabolism test, some doubt will remain as to whether the case is one of exophthalmic goitre or some other condition, most usually neurasthenia or the "effort syndrome." Under such circumstances the application of a therapeutic test may settle the question. Symptoms due to exophthalmic goitre will, in the majority of cases, rapidly subside as a result of rest in bed and the administration of Lugol's iodine solution, whereas such measures have little effect upon the manifestations of a neurosis or neuro-circulatory asthenia.

With regard to treatment. While it is generally admitted that in the majority of cases of exophthalmic goitre surgical removal of a portion of the thyroid gland will restore the patient to health more quickly and more certainly than any other measure, the importance of medical treatment in the pre-operative and post-operative periods cannot be exaggerated. In certain of its phases exophthalmic goitre should be considered absolutely inoperable and prolonged medical treatment may be required before thyroidectomy can be performed with a reasonable degree of safety. Severe cases may require weeks of such treatment in conjunction with the skilled application of X-Rays or radium preparatory to surgical intervention. Speaking generally, it may be said that, in the absence of obvious contra-indications, a patient is fit for operation whose basal metabolic rate has fallen below+40 and is steadily declining; who is showing a steady gain in weight and who no longer displays extreme nervousness and excitability. An operation upon a nervous and excitable patient with a high or rising metabolic rate is likely to be followed by a severe, perhaps fatal, crisis. Auricular fibrillation in the absence of myocardinal insufficiency does not contraindicate operation, often it persists throughout the pre-operative period to disappear after thyroidectomy. Usually it is not influenced by digitalis or quinidine and the concensus of opinion seems to be that these drugs should not be employed previous to operation.

Believing that the manifestations of exophthalmic goitre are due to the excessive production of thyroxin, part of which is incompletely iodised, medical treatment is properly directed towards reducing thyroid activity, detoxicating the abnormal thyroid secretion, and the restoration of a condition of good nutrition. Reduction of thyroid activity is aimed at by enforcing bodily and mental rest. This usually is difficult and is not to be attained merely by directing the patient to stay in bed. An attempt must be made to remove all sources of worry and strain and to control the ceaseless activity and excited conversation. Discretion will have to be used with regard to isolation, as the exclusion of desired visitors may serve to aggravate the patient's restlessness. The influence of a clever and sympathetic nurse is valuable in calming the patient, but usually will have to be supplemented by the free use of sedatives, such as luminol.

The abnormal thyroid product is neutralised by the use of iodine. Plummer's procedure is as follows: "For the first ten days

of treatment 10 minims of Lugols solution is given three times a day. For patients operated on, this dosage is continued up to operation and throughout the post-operative reaction even though the operation is postponed for several weeks. In cases that have not been controlled by operation and "recurrent" cases, and all cases in which operation has been indefinitely postponed the dose is reduced to 10 minims daily in from ten to fourteen days. Following the post-operative reaction 10 minims daily are given as a routine for eight weeks. If following this there is a recurrence iodine is given for three months if it completely controls, and is then discontinued. This programme is followed out as long as "recurrences" occur and are completely controlled by iodine. If they are not controlled, a second resection of the thyroid is performed."

Owing to their increased metabolism, patients with exophthalmic goitre require very large quantities of food. Sturgis and Green have calculated that a man with a metabolic rate of +50 doing a moderate amount of muscular work, requires 6,000 calories daily to maintain his nutrition. Usually in spite of a voracious appetite these patients suffer from a progressive loss in weight while leading an active life. A most important feature in the preoperative treatment of a case of this kind, therefore, is to furnish a high caloric diet. The patient's favorite foods should be discovered and every effort made to tempt his appetite. Glucose oxidation is very rapid in this disease and carbohydrates should be given in large amounts in an attempt to maintain the glycogen store of the liver. It is equally important to force the fluid intake. The high metabolic rate leads to increased production of heat and for the dissipation of this by evaporation an increased supply of water is necessary. To avoid dehydration the patient should consume at least 3,000cc of fluid in the 24 hours.

The routine medical treatment of a case of exophthalmic goitre, therefore, comprises rest, ensured if necessary by the use of sedatives, the administration of iodine, a high caloric diet and abundant fluids. A word remains to be said with regard to the management of the dreaded crisis or "thyroid storm."

The onset of this condition is sometimes foretold by nausea, vomiting, extreme excitability, increased rapidity of pulse and respirations, a rising temperature and a rising metabolic rate. Often, however, it follows immediately upon operation. Its management requires ice to control the temperaturs, morphine in large and repeated doses to calm the patient, the persistent administration of fluid by mouth and rectum and glucose solution intravenously. Lugol's solution must be given in large doses, 50-100 minims within a few hours by mouth, by rectum and intravenously in glucose solution.

Epiphyses.

G. M. FLETCHER, 2T8.

IN recent years the technique of producing roentgenograms has been greatly improved, and to-day the radiologist occupies a very important position in the world of Medicine and Surgery. A roentgenogram is the projection upon a photographic plate of a series of shadows of varying density; the density of these shadows is determined by the structures through which the rays have passed on their way to the plate. Obviously the value of an X-ray plate depends not only on the technique of its production, but also on the knowledge of him who is to interpret it. Correct interpretation depends on the interpreter's knowledge of the appearances presented by X-ray plates of normal and pathological conditions, and his familiarity with general medical and surgical problems. He must express the significance of each shadow in terms of normal and pathological processes.

The development of roentgenology has resulted in a great increase in our knowledge of bones and joints. Perhaps as important a branch of this work as any is the study of the growth of bones. Bones differ from other body structures in that they are fixed and rigid. However, like the other body parts,

bones must grow, and so a mechanism must be provided whereby they can both expand and lengthen. Expansion of the bones is brought about by the gradual deposition of bone by the periosteum. To allow bones to lengthen, nature has placed at each end of nearly all of them a highly specialized structure known as the epiphysis.

When the bones first appear in foetal life they are composed entirely of cartilage; soon ossification begins and the cartilage becomes bone. The long bones are well developed at birth except at their ends, which are still cartilaginous. At various ages these bone entremities, the epiphyses, commence to ossify, but they do not unite with the body of the bone until full growth has been attained. As a result of the ossification of the epiphyses there is a period in the development of the bone in which the body and the ossified ends are united by bands of cartilage. These cartilaginous bands are known as the epiphyseal lines; they are wide in the young and become progressively narrower until they ultimately disappear, due to union of the epiphyses with the shaft when growth is complete. These bands of cartilage lay down new bone and by so doing increase the length of the shaft; at the same time they reproduce their own substance. When they cease to reproduce their own substance then union between the epiphyses and shaft is complete—no longer cartilaginous—but now osseous. The epiphyseal lines are readily demonstrable by X-ray and any interference at these sites by disease or injury is attended by grave consequences to the bone involved.

In applying X-ray to the diagnosis of abnormalities in bones it is very important to have a thorough knowledge of the epiphyses. They are so important in bone growth, so readily affected by injury and disease that their normal development until fused with the body should be thoroughly understood. It must be known, therefore, at what times the centres of ossification appear, what appearances the epiphyses present at various ages and finally the period when the epiphyses unite and become an integral part of the bone. It must be remembered that at birth the epiphyses are for the most part composed entirely of cartilage and so are not demonstrable by X-ray unless the joints are inflated with air or gas—a proceeding that is rarely justified or practised. It is after ossification has commenced that information can be obtained. We can then judge by their size, position and contour whether they are normal or pathological.

There are certain variations in the positions of the epiphyses which must be borne in mind. The thumb metacarpal has its epiphysis at the proximal end, while the remaining four have their epiphyses at the distal end. This, in conjunction with the fact that all the phalanges have their epiphyses at the proximal end and that the thumb has only two phalanges, suggests that the thumb metacarpal is really a phalanx. A similar condition exists in the great toe.

Malnutrition retards the development of the epiphyses and in normal individuals there are wide variations in the time of appearance of the centres of ossification and in the time of fusion. Deviations from the normal process of development and union of the epiphyses are important factors in the production of deformities. Many deformities previously believed to be congenital are now thought to be the result of post-natal injury to the epiphyses. Certain diseases, notably rickets, congenital syphilis and scurvy affect the epiphyses, retarding growth and producing deformity. Then, again, in cretinism and infantilism there is marked delay in union of the epiphyses. In the various types of chondrodystrophies the reverse takes place; the epiphyses unite at a much earlier age than normal and consequently the bones are much shorter—but the periosteal growth continues until the bones reach their normal diameter.

Rickets, congenital syphilis and scurvy all occur in the same age period, i.e., in the first three years of life; all are characterized by multiple joint involvement and the joint surfaces of the epiphyses concerned are intact in all three diseases. The differential diagnosis depends, from an X-ray standpoint, on the changes in and around the epiphyseal line and the character of the periosteal changes. In rickets the changes are confined to the epiphyseal line; in syphilis the epiphyseal line and the bone behind it are involved; while in scurvy the epiphyseal line is intact and all the changes are confined to

Joint.	Description.	Appear.	Unite.
SHOULDER.			
No. of Epiphyses, 3.	Head of Humerus.	7 Mos.	20 Yrs.
	Coracoid.	2 Yrs.	
	Acromion.	14 Yrs.	18 Yrs.
ELBOW.			
No. of Epiphyses, 5.	Capitellum.	17 Mos.	
(rarely 6)	Trochlea.	10 Yrs.	13 Yrs.
	Int. Epicondyle.	7-10 Yrs.	14-18 Yrs.
(Rare)	Ext. Epicondyle.	About 11 Yrs.	
	Head of Radius.	5-7 Yrs.	14 Yrs.
	Olecranon Proc.	8-10 Yrs.	14 Yrs.
WRIST.			
	Radius.	6 Mos.	20-21 Yrs.
	Ulna.	6-7 Mos.	20-21 Yrs.
	Scaphoid.	4 Yrs.	Complete at 13 Yrs.
	Seminunar.	4 Yrs.	
	Cunieform.	3 Yrs.	
	Pisiform.	10-13 Years.	
	Trapezoid.	6 Yrs.	
	Trapezium.	6 Yrs.	
	Os Magnum.	6 Mos.	
	Unciform.	6 Mos.	
HAND.			
Metacarpals, 2 Centres.	Shaft.	3 Mos. Foet.	18 Yrs.
	Head.	3 Yrs.	
Phalanges, 2 Centres.	Shaft.	3 Mos. Foet.	18 Yrs.
	Head.	3 Yrs.	
HIP.			
Femur, 3 Centres.	Head.	6-12 Mos.	15 Yrs.
	Great Trochanter.	5 Yrs.	15-16 Yrs.
	Lesser Trochanter.	9 Yrs.	16 Yrs.
KNEE.			
	Tibia.	At Birth.	19 Yrs.
	Fibula.	5-6 Yrs.	19 Yrs.
	Femur.	At Birth.	19 Yrs.
	Patella.	5-6 Yrs.	
ANKLE.			
	Tibia.	5 Mos.	18 Yrs.
	Fibula.	12-15 Mos.	18 Yrs.
Os Calcis, 2 Centres.	Body.	At Birth.	Complete at 18-19 Yrs.
	Posterior End.	9 Yrs. 15 Yrs.	
	Astragalus.	At Birth.	Complete at 18-19 Yrs.
	Cuboid.	At Birth.	
	Scaphoid.	4 Yrs.	
	Ext. Cunieform.	3 ½ Yrs.	
	Int. Cunieform.	3 ½ Yrs.	
	Mid. Cunieform.	3 ½ Yrs.	

a zone of destruction, just behind the epiphyseal line. In rickets there is seldom periostitis; in syphilis there is marked periositis, while in scurvy the periostitis is frequently accompanied by sub-periosteal haemorrhage. In rickets there is atrophy and frequently multiple fractures; in syphilis and scurvy there is generally but slight atrophy—and no fractures.

After the third year of life tuberculosis and acute epiphysitis become more frequent and practically supplant rickets, syphilis and scurvy. In tuberculosis the infection is usually confined to one joint; acute epiphysitis is, as a rule, confined to one joint, but it may involve more. Successive roentgenograms of a tuberculous joint soon become hazy and indistinct; in acute epiphysitis the joint outline usually remains clear-cut. In a tuberculosis joint the cartilage becomes thinned; this is demonstrated by the narrowing of the joint space and later the bone beneath the cartilage becomes irregular and worm-eaten. The destruction

of the bone is by direct extension of the infection, never by metastases to other parts of the bone leaving normal bone between. In acute epiphysitis, on the other hand, the direct extension is more irregular and frequently there appear focal spots of disease not directly connected with the primary infection. When a tuberculous process in an epiphyses subsides and repair takes place, there is seldom new bone produced; repair is by fibrous tissue unless, perchance, the joint is secondarily infected through a sinus. In acute epiphysitis there is marked bone production and ankylosis is bony instead of fibrous, as is usually the case in tuberculosis.

Legg's disease (Perthes') is a condition so far known to involve only the hip-joint; it occurs just at the age when tuberculosis infections of the hip are so frequent. Clinically, it is very similar to tuberculosis, but it does not give a positive tuberculin reaction. From an X-ray standpoint it presents an appearance that is pathognomonic. There is no hazing of the joint; the epiphysis is not eroded. All bone detail is clear-cut and the cartilage is intact. The epiphysis seems to have softened and flattened out as if from pressure. The compression of the epiphysis makes it look denser than normal. The neck of the femur frequently seems broader than normal and a slight degree of coxa vara may be present as if the neck had softened and bent. The acetabulum is not involved except secondarily by the change in shape of the epiphysis of the head of the femur. Both hips may be involved.

Another condition in which an epiphysis is a very important consideration is in amputation through the shaft of a child's humerus. At the time of operation the overlapping of flesh and skin at the stump may seem ample. Later, due to continued growth at the upper epiphysis, the end of the humerus may push out through the stump.

Again, in the first twenty years of life the most important part of the lower end of the radius is the epiphysis. Its union with the shaft is weak, and trauma localized at this point will frequently displace it instead of breaking the bone. When this occurs the condition is much more serious than that obtaining in an ordinary fracture. In a fracture with faulty reduction the end result is a deformity; with a displaced epiphysis not only the deformity results, but what is infinitely more important, the growing portion of the bone is destroyed. If the epiphyseal seperation is not reduced the deformity steadily increases as the ulna continues to grow, while the end of the radius remains stationary. This will result in a marked deflection of the hand to the radial side, continuing to increase until the ulna has reached its full growth.

Fractures in the region of the elbow-joint are very common. In children supracondyloid fractions of the lower end of the humerous usually involve the epiphyseal line and the displacement of the lower fragment is generally backward and slightly towards the inner side. The lateral displacement can be corrected and held; the posterior displacement can be corrected, but often not held. In this fracture the periosteum is torn loose for some distance up the shaft and in the process of repair it throws down a strong, bony ridge and fixes the lower fragment. When this has occurred the lower end of the shaft may be found to be so far forward that it prevents flexion. Open operation in which the projecting part is chiselled off, results in a perfectly functioning joint. This fracture is frequently diagnosed as a dislocation of the elbow-joint. The medial epicondyle and capitellum of the humerus and the head of the radius are other sites where epiphyseal separation is common. It must be remembered that in children a great deal of the elbow-joint is composed of cartilage and that fractures involving only the cartilaginous structures are not demonstrable by the usual technique. For this reason it is advisable to be very careful in reporting "no fracture" in an injury to a child's elbow-joint.

A table giving the time of appearance and time of union of the epiphyses is appended. The value of this table in X-ray diagnosis is obvious.

References:—

(1) "Injuries and Diseases of the Bones and Joints."—Baetjer and Waters.

(2) "Radiological Review," Dec., 1925.

Haematogenous Osteomyelitis.

A. B. LE MESURIER.

OSTEOMYELITIS is the term generally, but loosely used to describe all forms of suppuration in bone. Haematogenous osteomyelitis is that variety in which the infecting organisms are carried to the bone by way of the blood-stream, and is the only variety that will here be considered.

The disease occurs typically in childhood and adolescence, more commonly in boys than girls, and is rare after the epiphyses have become united. The causative organism is either the staphylococcus aureus or the streptococcus haemolyticus, much more frequently the former. These organisms gain access to the blood through an infected lesion somewhere on the body—an infected cut, a boil, a nasopharyngitis or some such condition. This portal of entry may be a very trivial lesion, but it must be remembered that from any suppurative focus, no matter how small, living organisms can and usually do escape in varying numbers to soil the blood stream. Usually, however, they are dealt with adequately by the defensive processes of the body and rapidly destroyed, leaving no sign of their presence. But if they happen to lodge in a tissue that for any reason has a low local resistance, they are able to live, to multiply and to produce their characteristic suppurative focus. Such a condition of low resistance seems to exist in the ends of the shafts of the long bones—the metaphyses—and it is here, particularly where the resistance is further lowered by injury, that osteomyelitis occurs.

Whatever the exact method of action of the organisms may be, two things happen: one is the death of a varying amount of bone and the other is the formation of a collection of pus. The extent of the bone killed depends on the length of time before drainage is established, the virulence of the organism, and the resistance of the patient. Sometimes, particularly in streptococcal infections, there is no bone killed, but on the other hand the whole shaft may become necrotic. The process starts in the cancellous bone near the end of the diaphysis, and it is here that the pus is first formed. Owing to the rigid structure of the bone, the increasing amount of pus must spread somewhere, and the spread is nearly always into the subperiosteal space, stripping the periosteum from the bone in a direction away from the epiphyseal line. If the epiphyseal line is intra-articular, as it is at the upper end of the femur, the spread may be into the neighbouring joint, producing a suppurative arthritis. The collection of pus, like any other abscess, continues to spread until it either drains itself by bursting to the outside, or is drained by an operation.

With the provision of adequate drainage the process ceases to extend, and if there is no dead bone, will heal by granulation just as a soft tissue abcess does. If there is any dead bone present, and in the great majority of cases of osteomyelitis there is, the wound will not heal completely until the dead bone is got rid of. The process by which it separates is called sequestration, and is similar to the separation of a soft-tissue slough in that it is brought about by the formation of a layer of granulation tissue between the living and dead bone. It differs from the ordinary process of sloughing in that it takes much longer. Its rapidity depends in the extent of the line of separation and varies with the particular bone involved, being greater in the small bones like the phalanges and least in the bones forming the vault of the cranium. The process is more rapid in infants than in older children.

As a rule in the ordinary long bone, the sequestrum is completely separated in eight to twelve weeks. During this time there occur two other changes in the bone which are best followed in X-ray films. The first of these is the laying down of new bone—the involucrum—on the surface of that portion of the shaft that is still living. This can be detected first only after two or three weeks from the onset of the disease, as a faint irregular shadow on the surface of the bone, gradually becoming thicker and denser with time and lamellated in appearance. It is greatest in amount about the margins of the sequestrum, but usually extends over a

large portion of the shaft. It is firmly attached to the living bone, but as a rule stands away from the sequestrum, partly covering it in, but always leaving one or more openings or cloacae, which correspond to the unhealed sinuses through the soft parts and allow the escape of discharges. The other change, which also appears only after two or three weeks, is a rarefaction of the whole of the living bone, most marked about the sequestrum. This is probably inflammatory in nature, akin to the inflammatory reaction seen about any separating slough, and is accompanied by a considerable increase in blood supply.

The sequestrum itself undergoes no alteration in density. Having no circulation through it and no living cells in its depths, it lies unchanged like a block of so much marble, and retains the resistance to the X-rays that it had at the time it was killed. As a result we are able to distinguish the sequestrum in an X-ray film by its density, which is greater than that of the rarefied living bone, and are able to judge the degree of its separation by the completeness about it of the clear zone which represents the layer of separating granulation tissue.

A case of osteomyelitis may vary greatly in its acuteness. It may be part of a fulminating septicaemia ending fatally in two or three days, in which the bony involvment is a comparatively minor incident, or it may be sub-acute with a slow onset and symptoms and signs that are little marked. As a rule, however, the ordinary case is fairly acute. A child, either with or without a definite history of local injury, develops, in the region of a joint, a pain that becomes steadily more severe, will not use the affected limb and at the same time feels sick, and has a fever. Sometimes the original portal of entry of the infection is obvious, such as a discharging ear, but more often is trivial and found only on careful search, and sometimes is almost healed by the time the bone has become involved.

In the first few hours there is little to be detected on examination, but some tenderness on deep pressure, pretty well localized to a small area near the end of the shaft of the bone. Within the next two or three days the tenderness becomes more diffuse, swelling of the limb appears and increases rapidly and finally the skin becomes red and hot, and definite fluctuation can be detected. By this time the disease must be considered to be in the advanced stages. Considerable death of bone has probably occurred locally and the general reaction is severe, the temperature and leucocytosis being high and the child very sick.

In nearly every case the causative organisms can be cultured from the blood. These circulating organisms do not come from the original surface lesion, but come from the bone, which disseminates them in the same way as any other undrained abcess does, but to a greater degree, and they disappear from the blood as soon as the infected bone is adequately drained. From the blood they commonly lodge and produce secondary suppurative foci elsewhere in the body, usually in the metaphyseal region of other long bones. These secondary foci are nearly always less acute and less extensive than the first, presumably because the patient has developed some degree of immunity, and they often take the form of a Brodie's abscess—a slowly enlarging abscess in the cancellous bone containing pus and perhaps one or two small sequestra.

As long as the condition remains untreated, the patient readily loses weight and strength, other bones become involved and the local tension becomes steadily more extensive. He may die from the infection or may survive until the abscess or abscesses burst, and even then then death may occur from amyloid disease, resulting from the prolonged and extensive suppuration. The need, therefore, for early treatment is great, but before treatment can be instituted, the case must first be diagnosed.

When the bone involved is a superficial one as the tibia, no great difficulty should be experienced, but when the lesion is deeply placed, as in the femur at its upper end, its localization is often very difficult. Unfortunately, any X-ray change that occurs can be detected only after two weeks or more, and the X-ray is therefore useless as an aid to diagnosis in acute cases, except in that it provides negative evidence which excludes such things as fracture.

The diagnosis of osteomyelitis is made on the age of the patient, the history of pain coming on rapidly and progressing, the high

temperature and other signs of septic absorption, and locally the signs of a deep suppurative focus in the metaphyseal region of a long bone. It is distinguished from acute inflammations involving the joint, such as suppurative arthritis or acute rheumatic fever by the facts that the greatest swelling and greatest tenderness are not in the joint, but near it, on the other side of the epiphyseal line from it, and that if care is taken, the joint can be moved painlessly through a fairly complete range. It is distinguished from fracture by the progressive nature of the pain and swelling, by the signs of septic absorption, and by the absence of X-ray evidence of fracture. In some ways it resembles scurvy, but the constitutional signs are more marked and the evidence elsewhere of scurvy is lacking. In the early stages it is readily differentiated from cellulitis or soft-tissue abscess, but in the later stages, they are much alike. The distinction, however, is not very important, as much the same treatment is demanded.

The treatment indicated is the provision of drainage at the earliest possible moment. Osteomyelitis is a rapidly progressing disease, and the picture may change in a few hours from one in which a small portion of a single bone is involved in one in which the greater part of the bone has become infected, and perhaps other bones, and in which the organisms have gained such a foothold throughout the tissues that a fatal issue may result in spite of drainage.

The whole object of the primary operation is to establish adequate drainage. The incision is made, if possible, over the point of greatest tenderness, but if this is not possible, the bone is exposed through some safe anatomical approach. As the deeper tissues are reached, they will be noticed to become more and more oedematious, particularly the periosteum. If a sub-periosteal abscess has formed, and in most cases, by the time the diagnosis has been made, this has occurred, it will be found to be limited on the joint side by the firm attachment of the periosteum at the epiphyseal line, and to extend for a varying distance along the shaft and around it. The extent of this abscess has little relation to the size of the sequestrum ultimately formed. The bone itself is somewhat redder than normal, but there is nothing to distinguish dead from living bone, and therefore it is futile, at this stage, to attempt the removal of all the bone that is killed. Drainage of the bone is our object, and this is achieved by cutting a fair-sized window out of the cortex, and allowing the cancellous spaces to drain themselves through it. If no pus is found outside the bone, it is wiser to explore the deeper parts of the metaphysis in several places with a large drill, and to cut the window where pus is obtained. If the affected bone is a deep one, a drainage tube is let down to it; if it is superficial, the tube is dispensed with an the wound left open.

On account of its structure, bone drains less satisfactorily than soft tissue and it is usually four or five days at best after the operation before the temperature has reached normal, the constitutional symptoms have abated and the blood become sterile.

The wound rapidly cicatrizes and, in the comparatively rare cases where there is no death of bone, will heal completely. In the usual case, however, where there is some dead bone present, one or more discharging sinuses will persist until this dead bone has separated and been removed. In the meantime the treatment consists merely of keeping the limb at rest and seeing that the discharges are allowed to escape. The wound is dressed with moist dressing, as frequently as necessary, and any collection of pus opened as it appears.

As a rule, by the time the sequestrum has become separated from the living bone, it has also become partly roofed in by involucrum, and therefore spontaneous extrusion through a cloaca is rare, and an operation—sequestrectomy—must be performed for its removal.

In the rare cases in which the sequestrum consists of the whole thickness of the shaft, and its removal would interrupt the continuity of the bone, sequestrectomy should be delayed until the involucrum has bridged the gap between living bone or either side. In all other cases the sequestrum should be removed as soon as its separation by granulation is complete. The completeness of this process is best judged by the appearance in the X-ray of the clear zone separating the denser sequestrum from the less

dense living bone. In the ordinary long bone this separation is complete in three months from the onset of the disease.

The sequestrum may be single or there may be several, and, as even a small piece of dead bone left behind will prevent the wound from healing, the sequestrectomy must be thorough. The operation is best done where possible under a tourniquet. The sinuses are excised down to the bone. All cloacae are explored thoroughly, and, if necessary, enlarged by stripping back the periosteum and cutting away the involucrum with a chisel, and all sequestra are removed. The living bone, whether involucrum or original, shaft at this stage is pinkish from its free blood supply and comparatively soft, while the sequestra are hard, yellowish-white in colour and deeply and finely notched at their edges, where the separation by granulation has taken place.

The removal of all sequestra, while essential to success, is only part of the operation; in addition the wound must be left in such a condition that it will heal. A deep, narrow-necked cavity in bone will rarely heal by itself. No obliteration from collapse of its walls is possible, the ability of bone to repair the defect by bone is limited and the soft tissues cannot fall in and do their part. If, therefore, the cavity or cavities left after the removal of the sequestra are deep in comparison with their width, one of two procedures is adopted. If the cavity is single and deep and its opening narrow, a pedunculated flap, preferably of muscle, is tucked in, care being taken to prevent any interference with its circulation by kinking or construction. If the cavity is wider, or there are several cavities, the whole is converted by chiselling into a single cavity, very wide in relation to its depth. This procedure is called "saucerization," and allows the whole soft-tissue roof of the cavity to fall in and obliterate it.

No matter how the operation is done, it must be remembered that the wound left after sequestrectomy is an infected one, and while part of it may be closed by suture, ample provision must be made for drainage and wet dressings employed. If the operation has been complete, rapid healing may be expected.

The bone is left considerably thickened and irregular by the formation about it of the involucrum. In time this becomes less in amount and denser, but a bone that has once been the seat of any but the smallest focus of osteomyelitis nearly always shows some permanent change in shape and often in length. If the epiphyseal line is damaged, the growth may be greatly retarded or, what is worse, may be uneven, with the occurrence of an angular deformity getting steadily more marked with growth. But probably the most distressing late feature of osteomyelitis is that it is impossible to know definitely when a case is completely cured. Apparently living organisms may remain locked up almost indefinitely in the healed bone and may, even after several years, be stirred into activity through injury or some other cause, and produce suppurative lesions, usually subacute in character, in the same or in another bone.

Osteomyelitis, on the average, is one of the worst treated of the surgical diseases of childhood. This is not because the treatment itself presents any great difficulty, but is because the condition is not diagnosed sufficiently early. At best the disease is a severe one, but without treatment the outlook is very grave. Nor is the diagnosis in the ordinary case really very difficult. The trouble seems to be that the possibility of the occurrence of osteomyelitis is not considered. As a matter of fact, it should be the first thing thought of when a patient, still of growing age, complains of a pain near a joint and has a fever. If it were, few cases would be missed and the drainage operation would be performed while the patient was still in good shape and in time to prevent the extensive destruction of bone locally and the spread of infection to other bones.

Eruptions of the Skin Due to Drugs.

HAMNETT A. DIXON, M.B.

THE diagnosis of a drug eruption is a importance and often of great difficulty. In a suspected case it may be possible to get a definite history of taking the drug, though not uncommonly it has been taken in the form of a patent medicine. An example of such a medicine is Clarke's Blood Tonic, which contains potassium iodide.

The eruption may be the only evidence of ill effects, while in some cases there may be associated mild or severe general signs and symptoms, such as coated tongue, congested fauces, diarrhoea, headache and dizziness. The lesion may appear following the first dose or not until it has been taken over a long period. Occasionally the eruption appears some weeks after the drug has been discontinued. Continuing the medicine at fault or increasing the dose tends to aggravate the condition.

The skin change may take many forms: Some of the more common types are erythematous, papular, pustular, vesicular, urticarial or bullous. The parts most commonly affected are the chest, back, face, shoulders and legs. Although the same drug will cause many varieties of eruption in different individuals, there are a few rashes which are common to certain drugs and therefore appear to be caused by their specific action. As examples we might mention the pustules and "warty" like lesions caused by bromides and iodides, or the "horny" thickening due to arsenic. The thickening of the skin due to arsenic is explained as the result of the stimulating effect on the epidermal cells. The "warty" lesions due to bromides are the result of the irritating action of the salt on the epidermal cells and on the underlying corium, giving rise to granulomatous infiltration. The pustules and papules due to iodides are the result of an irritating action on the sweat glands, sebaceous glands and the surrounding cells.

Why do drugs produce skin lesions? Probably the most common cause is imperfect kidney elimination. The majority follow the taking of medicine by mouth. Occasionally we see a generalized eruption following the application of a drug to some local area. Such changes may occur following the use of a belladonna plaster, a turpentine dressing, an iodoform dressing, or a mercury salve. Recently cases have been met with in whom butisin picrate, applied in dressing burns, set up a localized dermatitis followed by the appearance of erythema in distal parts.

As the majority of drug eruptions are erythematous, it is necessary that they be distinguished from scarlet fever and measles. The most important point is the absence of fever, though there may be furred tongue and congested fauces. Also there is not the same incubation period, the eruption generally coming out rapidly and disappearing when the drug has been stopped. It is rare to find desquamation following the erythema produced by a drug.

Treatment consists of discontinuing the drug responsible and eliminating rapidly by means of diuetics and aperients.

We shall describe the eruptions produced by drugs in common use.

Arsenic: In acute arsenical poisoning the lesion is erythematous as in scarlet fever or measles. This may be associated with swelling of the palms, soles and eyelids, fever, abdominal pain and diarrhoea. When the drug has been taken in small doses over a long period, the skin, especially over the palms and soles, becomes thickened, forming hard, dry, spine-like processes. This hyperkeratosis develops gradually and may not appear until some time after the arsenic has been discontinued. The nails become thickened, dry and brittle. In some cases the areas of thickening degenerate, giving rise to squamous celled epithelioma.

Antipyrin rash appears over the chest, abdomen and flexor surfaces of the arms and legs as a scarlet fever like erythema. The erythema may be followed by desquamation.

Bromide, especially the potassium bromide, is a common cause of skin lesions. The areas affected are the face, shoulders, arms or legs. The most common type of lesion is crusted, granulomatous or "warty."

Erythema, urticaria or furuncles may appear. I recently saw a single "warty" patch on the leg of a woman who had been taking a mixture for epilepsy over a period of eighteen years. The lesion had been present two years. At the Hospital for Sick Children we have seen three cases of bromide eruption in nursing infants. The mothers were taking medicine containing bromides and the drug was carried to the children by way of the milk. The mothers were not affected.

Iodides, especially potassium iodide, is commonly used. Many people are sensitive to the drug. Papules and pustules appear over the face, chest and back. They resemble the disease known as acne vulgaris, though "black-heads" are not found unless, of course, acne is also present. To prevent iodide and bromide eruptions avoid the potassium salts. A small amount of arsenic added to the mixture may also prove helpful.

Mercury, no matter how prescribed, may produce scarlet fever like erythema. Accompanying this may be fever, diarrhoea and inflammation about the teeth.

Morphine occasionally gives rise to a diffuse, irritable erythema affecting the chest and abdomen.

Quinine, when in small doses as in patent medicines, may produce erythema, urticaria or eczema-like lesions. The face, chest and back are most commonly affected. An example of this eruption was recently seen in a patient who had taken a bottle of "Phospheine."

Sodium salicylate causes urticaria and erythema.

Phenolphthalein, commonly used as a laxative, may produce erythematous or livid plaques over chest, abdomen and arms. Two cases seen occurred in children following the use of phenolphthalein chicklets. The areas affected were the abdomen and chest.

Turpentine, used in liniments, may cause erythema or a papulo-vesicular dermatitis. It has been noticed that erythema and papules will appear on surfaces distant from the area of application.

In conclusion we would say that nearly every type of cutaneous eruption may result from the effect of some drug. Similar eruptions may be produced by different drugs, and the same drug may cause different eruptions in different individuals.

MISTURA

If you have read anything, even remotely, connected with medicine, which you think others might enjoy reading, Mistura will always be here to let the other readers of this journal know.

We are glad to be able to say that several readers of the Journal have noticed Mistura and have volunteered suggestions.

The Art of Medical Treatment, Palfrey.—(J.B.L., 2T7).

The Physician Himself, D. W. Calthell.—(W. A. M. D., 2T7).

Doctor and Patients, Hayes.—(E.B.P., 2T7).

The Doctor's Dilemma, Bernard Shaw.—(Prof. J.J.R.M.).

A Doctor's Memories, V. C. Vaughan, M.D. (Prof. J. P. McM.).

PROFESSORS OF PHYSIOLOGY EXCHANGE.

Prof. McLeod of the Department of Physiology has been granted leave of absence for three months and has gone to Leland Stanford University. His place here is being taken by Prof. Martin, head of the Department of Physiology of that University. We are pleased to welcome Prof. Martin to Toronto, and we hope his stay here will be enjoyable and profitable to him as we know it will be to us. Perhaps he will stir up more "muscular exercise" among the tardy ones of the 3rd year.

2T7 HAS DONATED A SILVER CUP FOR INTER-YEAR MEDICAL BASKET-BALL.

The Blood Supply of the Kidney.

H. A. CATES,
DEPARTMENT OF ANATOMY, UNIVERSITY OF TORONTO.

IN any discussion of the function of an organ an intimate knowledge of its gross and microscopic structure is essential. In an organ whose particular function is the maintenance of the blood plasma at a definite concentration of salts, etc., a knowledge of the blood supply is of paramount importance. It is with a view of emphasizing certain features in the arrangement of the vessels of the kindney—features that have apparently not yet received complete approbation—that this short note is concerned.

In practically every standard text-book of Anatomy or Physiology that one has consulted the branches of the renal artery are described briefly somewhat as follows On entering the pelvis the renal artery divides into the Arteriae propriae renales, which enter the substance of the kidney in the renal columns. Two pass to each pyramid at its sides and anastomose round its base—thus forming the arterial arcades or arcuate arteries which run therefore in the zone between cortex and medulla roughly parallel to the surface of the kidney.

From the convexity of the arcuate vessels interlobular arteries arise which pass into the cortex and give off the important afferent vessels to the glomeruli. The smaller efferent vessel of the tuft finally breaks up into a secondary capillary network surrounding the tubules. The efferent vessels from those glomeruli lying in the boundary zone, however, i.e., between cortex and medulla and in the vicinity of the arcuate vessels—break up into a capillary leash which runs straight into the medullary substance; these are known as the Arterioles Rectae Spuriae or false straight vessels. It is to be noted that the interlobular arteries are all end-arteries and therefore do not anastomose with adjacent vessels. They are described as terminating in the region of the Capsule of the Kidney by breaking up into a final capillary set for the supply of the fibrous tunic. So far one may point out that the second set of capillaries destined for the tubules has been derived wholly from the efferent glomerular vesseds.

From the concavity of the arcuate arteries are further described other vessels which run straight down into the substance of the medulla—the so-called Arterioles Rectae Verae or true straight arterioles which quickly break up into leashes of capillaries running to the apices of the pyramids to supply loops of Henle and the collecting tubules. It will be observed that unlike all others these arterioles rectae verae are not derived from efferent glomerular vessels, but spring directly from the arcuate arteries. Thus the supply of the tubules is described as a double scheme—some direct from the arcuate arteries the vasa vera and some from efferent vessels of the glomeruli situated in the boundary zone—the vasa spuria.

As long ago as 1907 serious doubt was thrown on even the existence of these vessels derived from the concavity of the arcuate arteries—the arteriolae rectae verae. Huber[1] by a corrosion method seemed to show that these vessels were all post glomerular; that while they seemed at first sight to spring from the concavity of the arcuate arteries they could, by careful focussing, be observed to arise from efferent glomerular vessels in that vicinity. In other words, the so-called true vasae rectae were indeed spurious whereas the false vasae rectae were the only true ones to be found! By an improved technique which consisted of vital staining with Janus green and injection of the vessels by means of carmine gelatin—MacCallum[2] has recently confirmed the findings of Huber.

In an examination of 150 sections of injected kidney one has failed to find any vessels arising from the arcuate arteries and going directly to the medulla, but one is struck by the fact that vessels which at first sight appear to be so arising are practically already capillary in size and look altogether

1 Huber, G. Carl. American Journal of Anatomy. Vol. 6.

2 MacCallum. American Journal of Anatomy. Vol. 38; pp. 153-175.

too small to be direct branches of the relatively large arcuate artery. They can usually be traced to an efferent glomerular vessel lying in the vicinity. The well-known fact also of the very much greater calibre of the afferent vessel may be stressed. Furthermore MacCallum found that the terminations of the interlobular arteries were not in capillary fields for the supply of the fibrous capsule, but were again in afferent vessels to the glomeruli lying in the peripheral parts of the cortex. The capsular supply was independent of the interlobular arteries altogether.

An interesting point upon which no light has been thrown is the question whether the efferent vessel of a given glomerulus is wholly destined for the same system of Uniniferous tubules to which that glomerulus belongs. Or may one consider an interlobular end artery as dominating a complete system of its own in a similar manner; and by dilation and constriction produce periods of activity and rest in the glomeruli which it supplies? If either deduction be allowable it is relatively easy to understand the periodic rest and activity which some observers have noted in the glomeruli. The important fact to be observed, however, is that it seems reasonably well established that the blood to the whole of the tubular system is by means of vessels that have already passed through the glomerular tuft. Further, the observation seems confirmed that the capillary tuft is not to be regarded as one continuous twisted and tortuous skein entering as an afferent and leaving as a much reduced efferent vessel; but that—as in other capillary fields—there exist cross communications between various portions so that it is possible for blood to be 'short-circuited' from afferent to efferent vessel without traversing very much of the capillary field. This, of course, one would expect, once it is established that all renal blood is primarily glomerular; otherwise atrophy of a glomerulus would involve obliteration of the supply to tubules as well.

This manner of distribution of the renal artery is in accordance with what one might expect to find from a consideration of the development of the metanephros. It will be recalled that the collecting system of tubules develops by repeated branching of what is, in effect, the Wolffian duct and that with each division, the metanephric blastema also divides, the termination of each collecting tubule before therefore surmounted by a portion of metanephric tissue. This metanephric tissue gives rise to Bowman's capsule, the convoluted tubules and the loops of Henle. (The lobulated condition of the kidney that this developmental process indicates persists in some of the lower forms throughout adult life). Into this metanephric tissue a blood vessel grows and immediately established contact with that part which gives rise to Bowman's capsule. It would, therefore, appear that it was from this point that the rest of the urinferous system was supplied.

One may now ask how far can the theories of renal secretion be correlated with these facts?

The original theory of Bowman elaborated by Heidenhain—the so-called "vital theory"—ascribes to the glomerulus the secretion of watery constituents and diffusible salts—in very dilute solution and to the tubules the secretion of various organic and inorganic salts. The addition of the two is the relatively highly concentrated urine.

Ludwig's "physical theory" supposes the glomerulus to act simply as a filter to let through a large volume of very dilute plasma; concentration, by reabsorbtion of fluid being the work of the tubules.

The so-called "modern theory" elaborated by Cushny is very like Ludwig's theory. The glomerulus filters through blood plasma minus the colloid proteins—the tubules reabsorb "threshold bodies" such as sugar, but leave behind non-threshold bodies" such as urea; they also reabsorb large quantities of fluid.

In a consideration of any of these theories it would appear that not sufficient emphasis has been laid on the vastly different type of blood that is carried in the one case to the glomeruli, and in the other case to the tubules. If the whole blood supply is primarily glomerular then the blood carried to the tubules must be a relatively highly concentrated fluid—witness the great difference in calibre of afferent and efferent vessels. Now if in one case fluid can be

poured into the non-threshold bodies held by the vital activity of the cells of the convoluted tubules—into the highly concentrated,—relatively fluid free blood—which is supplied say to the loop of Henle?

In this connection it is interesting to note the various types of cells which one meets with in the tubular system.

In the glomerulus—a single layer of flat clear plate-like cells eminently suited to filter through large quantities of plasma.

In the convoluted tubules both proximal and distal—cubical granular cells such as one readily can imagine capable of dealing with "threshold" and "non-threshold" bodies.

In the descending limb of Henle's loops, —again the flat, clear cells very similar to those found in the glomerual capsule and again suited to the free passage of fluid.

Oertel[3] further emphasizes the changes that one sees in the epithelium of the various parts of the tubule in certain types of chronic nephritis and interprets these changes in the light of the altered characters of the urine. He notes that the cubical granular epithelium of the convoluted tubule may become flatened, possibly in an effort to take over the function of the lost glomerulus.

One might further point to the sequence of events—blood carried to the glomerulus first—thence to convoluted tubules and thence to Henle's loop:—a sequence that suggests itself if one may accept the "modern theory" of secretion. The observations of Huber on the function of Henle's loop are of interest in this regard.

In conclusion let it be noted that one may theorize indefinitely and theorizing may be altogether a bad habit. The important fact one desires to emphasize, however, is the sequence of supply of blood—glomerulus first, tubules afterwards. It seems strange that this conception pointed out twenty years ago does not yet find a place in current text books. Here and there one finds a very brief note, but one still sees prominently pictured and deftly described the Arteriolae rectae verae as if they were the important source of supply to the medullary substance when as a fact their existence is, at least, very seriously questioned..

3 Oertel. Can. Medical Association's Journal. Vol. xv., No. 4; pp. 356.

Some Notes on Physical Examination.*

J. L. UREN, 2T7.

Bronchial Breath Sounds.

THE breath sounds heard over the normal lung are described as vesicular. These sounds are chiefly produced by the air passing through the larynx. The sounds produced in the larynx are added to or modified by the air entering the alveoli. The resulting effect gives the breath sounds their vesicular character. If the bronchi are patent and the aveoli are filled, collapsed, or destroyed, removing the vesicular element, bronchial breath sounds will be heard.

The alveoli may be filled with:

1. Exudate—Pneumonia, Lung Abscess, Tuberculous Lesions.
2. Transudate—Oedema of the Lung.
3. Blood—Infarction.
4. Fibrotic Material—Fibrosis.
5. New Growth.

The alveoli may be collapsed by, and the bronchi left patent by:

1. Pleural Effusion. Prolonged collapse may lead to fibrosis.
2. Pneumo Thorax.
3. Empyema.

The alveoli may be destroyed by:

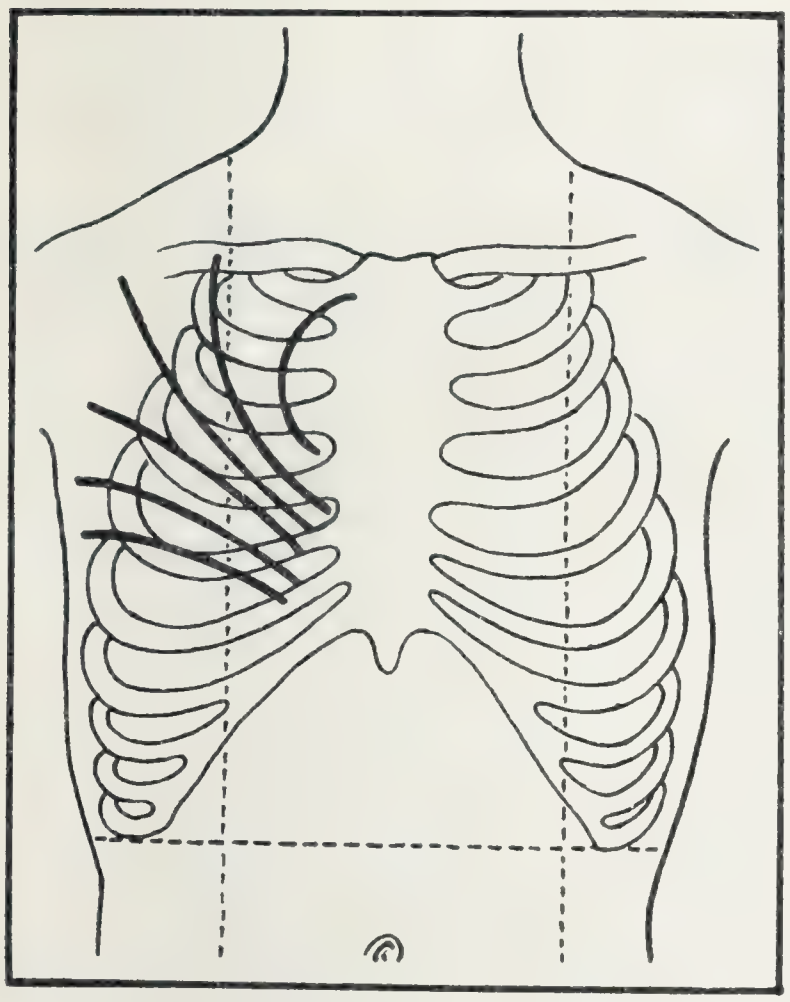
1. Ulceration.
2. Cavitation.

Differential Points Between Consolidation of the Lung and the Fluid in the Pleural Cavity.

The distribution of dullness is characteristic. In consolidation the dullness is usually limited to one lobe. In effusion the fluid has a definite characteristic shape when not limited by adhesions or associated with a pneumo-thorax. (See diagram).

If, associated with an area of dullness, there is little or no limitation of movement,

*Approved by the Department of Medicine.



plural effusion is the most likely cause of the dullness.

Bulging of the interspaces indicates a large quantity of effusion.

The displacement of the mediastinum toward the resonant side of the chest is indicative of fluid in the plural sac. The displacement of the mediastinum is evidenced by:

1. displacement of the trachea.
2. The position of the Apex beat.
3. The percussion of the borders of the heart.

N.B.—The breath sounds as a differential point are of little importance and may even be misleading because in plural effusion the breath sounds may be bronchial, vesicular, or absent. The absence of breath sounds would favour the diagnosis of effusion, but bronchial breath sounds with bronchophony might be present in either consolidation or effusion.

Percussion of the Heart.

Before percussing the apex of the heart it is advisable to percuss the lower border of the lung from the left anterior axillary line to near the sternum. When the lower border of the lung has been marked out, using ortho-percussion (percussion at right angles to the transverse plane of the body), percuss from the anterior axillary line about one-half to three-quarters of an inch above the border of the lung and parallel to it. This percussion should be light. The first point of lessened audibility gives the left heart border at its maximum distance from the sternum.

In the fourth interspace on the left side percuss along the interspace. The first point of lessened audibility gives the border. In the second and third interspace the root of the lung will change the percussion note. For this reason it is necessary to select the point where this maximum change in audibility occurs to mark the border of the heart or aortic arch.

Aortic Diastolic Murmur.

If an Aortic Diastolic Murmur is heard on the right side of the sternum as loud as or louder than it is on the left, it is almost proof of Aortic Dilation. The only other condition that will produce this result is the shifting of the mediastinum to the right.

Latent Post-Tussive Rales.

To produce latent rales it is always well to auscultate over the whole chest, having the patient breathe chiefly with the mouth open and cough at the end of the forced expirations.

The Descent of the Thyroid Cartilage on Inspiration.

In a normal individual the thyroid cartilage does not move down during normal respiration. At the end of a deep inspiration it will move down. In certain cases when there is increased tension on the peri-cardium as in peri-carditis with effusion, the thyroid cartilage will begin to move down at the beginning of inspiration. This is usually a grave prognostic sign.

Medical Society Meeting.

SPEAKER—PROFESSOR KLOTZ.
SUBJECT—WEST AFRICA.

THE following is an abbreviated report of the address given by Professor Oskar Klotz before a meeting of the Medical Society in Hart House on the evening of December 3rd, 1926:

For a period of six months in 1926 Dr. Klotz was associated with the Yellow Fever Commission of the International Health Board, with headquarters at Lagos, Nigeria. This Commission was organized for the purpose of carrying on intensive studies upon Yellow Fever on the West Coast of Africa. The West Coast, in which yellow fever has appeared at various times, and where in certain centers the disease is endemic, extends from Gambia in the north to the Congo in the south. This vast area includes the British colonies of Gambia, Sierra Leone, Gold Coast and Nigeria, the French possessions of Senegal, Ivory Coast, Dahomey, Cameroons, and Equatorial West Africa and the Republic of Liberia.

This region has had for centuries an evil reputation among civilized nations. It has been known ever since Roman times and from then until comparatively recently, expeditions from civilized countries always encountered great difficulties. The troubles were of various kinds: difficulties with the natives, due chiefly to their superstitious pagan beliefs; plagues; pests, and various tropical diseases. Another great difficulty has always been the problem of communication. There were no roads, but only footpaths through the dense jungle. Thus it was no wonder that each individual or party returned with no good word for the country. In modern times, conditions have gradually changed and organized systems of government are solving many of the former short-comings.

The Spaniards and Portuguese and those who went before them, sought new land for wealth—in the case of West Africa for gold, ivory and slaves. Their conduct in Africa was much like their conduct in America. They were destructive rather than constructive. They carried on wholesale robbery in a cruel fashion, leading to disorganization of the natives and setting the country in an uproar by encouraging slave raids, the coast natives bringing their prisoners from inland tribes and selling them to the traders.

British, Dutch, German and Danish attempts at colonization were for many years complete failures. At present the European population is represented by a few scattered settlements along the coast with little attempt at penetration into the interior.

The native population is made up of many tribes with their own respective forms of simple government. If left alone, they regulate the affairs of their own district successfully; in this the British are co-operating with them. However, due to the memory of the old slave raids, unrest persists. Realizing, however, that a peaceful state is to their advantage, they are gradually settling down. Tribes live under varied conditions—in scattered rural districts, or in part in towns and villages. Families live in groups or compounds of stockades, from twelve to seventy-five in such enclosures. Their houses are merely mud huts, somewhat similar to the abode houses in Central and South Africa. There is little attempt at architecture, square buildings with sloping thatched roofs of palm leaves being the common type of protection. The floors are mud and in some cases partitions separate the sleeping from the community quarters.

Their food is simple and in large part is found in the jungles. Small plots are cultivated, producing corn, of which they are very fond. Yams, cassaba and palm oil are staple articles of diet, palm oil in addition being the chief export of the region. On the coast, fish are also used and in the towns and cities where rats and bats are abundant they form delectable dishes. Cattle do not thrive in these regions because of the tse-tse flies leading the trypanosome infections. Although horses are brought in yearly by Englishmen for polo, they may not survive beyond a season for similar reasons. On festival occasions the natives have meat; in earlier times human sacrifices were

carried out and some of the tribes were canabalistic; this is now a thing of the past and goats are used. They are fond of meat when they get it, and according to our standards are not too particular about its source. Some of the native servants in the laboratory of the Commission were not adverse to eating the animals which had been used for experimental purposes. This, when discovered, necessitated the immersion of all such animals in lysol to destroy their palatability.

The natives are not fond of work, but are very approachable, and with a little consideration for their customs, there is usually no difficulty in gaining their confidence and co-operation. Generally speaking, they are very ready to help.

Cities there are many, and they vary in size from 40,000 to 500,000. All of them are aggregations of huts closely huddled together with no order or plan, with resultant dangers of infection. Such conditions make possible the further spread of the many tropical diseases, some of which have hitherto been confined to limited areas only; an instance of this is sleeping sickness, originally confined to the Central Congo and its environs, and now penetrating the Cameroons and North-eastern Nigeria. For some years intensive studies have been prosecuted to determine means of staying the progress of the spread. Only within recent years has the treatment in the early stages of sleeping sickness met with success, so that infected individuals need not fear the dire calamity which befalls the untreated cases. Furthermore, the activity of the medical service has found means to check extension of the endemic areas by destroying the breeding ground of the tse-tse fly. Much of the research is done locally in these tropical regions, and under conditions which are often very uncomfortable for the investigator.

Due to such unsanitary conditions, plague and pestilence are not uncommon. Malaria is universal, being worse in some districts than in others. Yellow fever is found mostly on the Gold Coast and in Nigeria up to 100-150 miles inland. It has been prevalent here for a long time and the natives have developed a certain immunity to it. New foreign arrivals form the majority of serious cases.

The disease is transmitted by an insect vector, the mosquito (Aedes aegypti). This mosquito takes up the organism from infected persons and transfers it to a new host after an incubation period of twelve days. Only in the first three days of the human infection can it acquire the organism. Twelve days elapse before it can infect a new individual. The malarial mosquito (anopheles) is rural in its habits; the stegamyia, on the other hand, is domestic. It prefers to bite and live upon man. The female will not lay her eggs until she has taken blood. They breed in water containers of all kinds, consequently they are found in close proximity to native dwellings, seldom more than 150 feet from a house. As a water supply is commonly kept in such containers, there are usually plenty of ova about native dwellings and with their increase in the rainy season one also gets an increased incidence of yellow fever.

Bubonic plague has been recently introduced and is rapidly gaining ground. In Lagos, a city of 100,000, the British have introduced roofs, replacing the verminous thatch, thus combating the plague by reducing the number of rats. There has been quite an epidemic of plague this year with many deaths in Lagos.

Cases of yaws, relapsing fever and intestinal worms are not uncommonly encountered. Ascaris lumbricoides is present in about 100 per cent. of the urban population and hookworm is about 60 per cent. Guinea worms are not infrequent and the natives have acquired some considerable skill at extracting the worms from the skin by winding them upon sticks and rolling them up a slight amount daily.

Tuberculosis is not very prevalent. Venereal diseases are present, gonorrhoea being common; the incidence of lues is not obtainable because of the presence of yaws which, like lues, gives a positive Wassermann reaction. Pneumonia when seen is usually of the bronchial type, while cholecystitis is absent entirely and appendicitis very unusual.

Medical Service in British West Africa.

The Medical Service in West Africa has been organized under the Colonial Office, and a well-arranged medical department is found in each of the colonies. The officers

in this service have a variety of duties, both in developing the sanitary measures of their district, and in caring for the endemic and epidemic diseases arising in the natives. Additions are constantly being made to this staff, and specialization in the different departments of medicine is rapidly developing. The government is actively furthering medical research in tropical diseases. There are some colored native physicians trained at Edinburgh who practise in Lagos, where they make an excellent living.

Native "Medicine-men" using charms and incantations, are also present and add somewhat to the difficulties of the legitimate practitioner.

The colonial medical service man has many difficulties in his work, not the least of which is the difficulty in obtaining accurate histories through the use of interpreters. Notwithstanding this, many of the men enjoy the service in the tropics, while at the same time give excellent service. They are allowed to carry on private practice, which in part consists of the care of the personnel of trading and mining companies. Living conditions are fair; the government provides living quarters and allowances for maintenance in the hinterland. All in all, for the men who likes tropical medicine and an outdoor life, the West Coast of Africa offers an attractive field.

Combative Cocci.*

Some skirmishing cocci, arranged in a chain,
Were encamped on a broad intermuscular plane
Engaged in a scheme, in discussion profound
For making a raid on the tissues around.
But a wandering leucocyte, out as a spy,
Caught sight of the camp and at once "did a guy,"**
Through a withering volley of toxins that fell
From a sentinel coccus that spotted the cell,
With movement amoeboid, astoundingly fleet
He beat a most diapedetic retreat
To a telegraph office he noticed at hand
And cabled the news to a neighbouring gland.
The cocci, on hearing the sentinel's news,
Were already beginning to shake in their shoes.
But an officer shouted, "It's nothing to us
If the leucocytes come we will knock 'em to pus."
The phagocytes came with a rush from the gland,
But the germs were intent upon making a stand,
And the general cried, "We will make 'em repent,
Up cocci and at 'em," and at them they went.
The scene that ensued was a terrible sight
And the battle it raged for a day and a night
Till millions and millions of phagocytes slain
Were heaped in an abscess that swelled on the plain.
The cocci were shouting and talking big talk
And crying, "We cocci are cocks of the walk,"
When their general suddenly cried through the strife,
"We're done for—I see the old Doc. with his knife."

*Reprinted from Oxford Students' Journal.
**Ran away

Battle of Furunculus.*

(A lay made about the year Twenty-one of the Constitution).

Staphylococcus Aureus,
By Gram and Koch he swore
He would invade new regions
Unconquered heretofore,
By Gram and Koch he swore it—
To take a patient's life
And called the Cocci, young and old,
From all the colonies of gold
To aid him in the strife.

Loud rang the warning toxins,
And flashed the summons forth
On the distant slopes of Agar
And the turbid seas of Broth;
The Cocci clustered thickly
From far off lands and labs.
Cocci of ancient culture came,
To come by tube they thought no shame,
But of others of a fiercer fame
Drove up in acne scabs.

The septic hosts of Cocci
Advanced in serried ranks,
They marched upon the Blood Stream,
And camped upon its banks;
Forth flew the watchful blood-cells
Crying in wild turmoil:
"Staphylococcus Aureus
Has come and raised a boil!"

Far down the purple current
Was borne the direful shout—
The polymorphonuclears
And lymphocytes rush out;
Shame on the Eosinophile,
Who comes not forth to foil
The deadly Golden Coccus
At the Battle of the Boil!

And fiercely raged the conflict,
And thick lay strewn the dead:
The Battle of Furunculus
Was coming to a head!
The pale and lifeless pus cells
In scores were borne away,
But not a single Coccus
Survived that bloody fray.

Staphylococcus Aureus
Still wields his golden chain,
Where falling in the central slough
His friends around lie slain;
Surrounded and outnumbered
Still valiantly he fights—
He sees his tawny hosts grow less,
He sees the battle's hopelessness
Yet ever through the Yellow Press
Defies the leucocytes.

Staphylococcus Aureus
Has fallen in the fray,
Upon a martial coverslip
They bore his corpse away—
Lying in state in Canada
Embalmed he long remained
For though he dyed Gram positive
His honour was unstained.

And still at festive seasons,
When the blood is really stirred,
Before the full post-prandial rise
Of white cells has occurred,
When the phagocytes sit waiting
With platelets undersized
For the evening meal of microbes
Which is being opsinized;

When the trembling Eosinophyle
That wrought the deed of shame,
Immune from fresh invasion
Comes forth his share to claim,
And talks of Staphylococcus,
And mocks his ancient frame
(For now the Yellow Peril
Is nothing but a name),

Some old and hoary leucocyte,
Who finds he's in the vein,
Will tell the well-known story
Of his battles once again;
While blood cells sit in rouleaux round
To hear the tale retold
Of the Battle of Furunculus
In the brave days of old.

RBP., S.B.H.J., Oct., 1909.

---

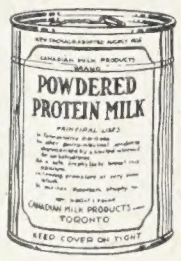
*Reprinted from "Round the Fountain" and St. Bart's Hospital Journal.

A DIRECTORY OF THE C.M.P. GROUPS OF DIET MATERIALS

"To provide that for which a need exists" is the basis upon which this group of diet materials is built. Every product rests upon a solid scientific foundation, and is clinically tested before it is offered.

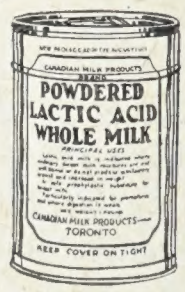
KLIM
Powdered Whole Milk

A safe, dependable whole milk for infants, children and invalids. Uniform, free from harmful bacteria and more easily digested than liquid milk. Nutritive properties, including the vitamines, retained.



POWDERED PROTEIN MILK (C.M.P.)

Almost a specific in diarrhoeas of infants and children. Very useful in marasmus, chronic intestinal indigestion and for the new-born, including prematures. A product developed by the Hospital for Sick Children, Toronto.

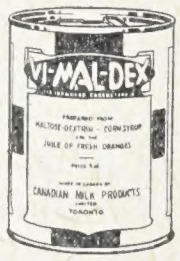


POWDERED LACTIC ACID MILK (C.M.P.)

A splendid acid milk of normal composition made by culturing 2 per cent. milk with a pure culture as supplied by the Hospital for Sick Children, Toronto. The indications for lactic acid milk are many, and this product fulfils the ideal.

C.M.P. POWDERED SKIMMED MILK

A fat-free milk very useful in low-fat diets and for reducing the percentage of butter-fat in Klim Whole Milk when desired. Free from pathogenic bacteria.



VI-MAL-DEX

The Improved Carbohydrate

A carbohydrate prepared from maltose, dextrose, dextrin and the juice of fresh oranges. The content of orange juice is adequate for the daily needs of an antiscorbutic, the Vitamine C being fully retained.

KLIM Wafers

Powdered Whole Milk flavored with juice or chocolate and pure orange or lemon pressed into wafers, making it possible to eat milk with a relish. For school lunches and for children having a too strong penchant for sweets, for post-operative cases, and in ulcer management. High caloric value with minimum bulk.

THE C.M.P. POLICY

No feeding directions appear on trade packages, and instructions are not given to the laity. Complete literature on and samples of any of these products cheerfully furnished to physicians on request.

CANADIAN MILK PRODUCTS LIMITED

347 ADELAIDE STREET WEST, TORONTO

Subscribers are respectfully requested to patronize firms advertising in the Journal